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Editorial.

ON ENCOURAGEMENT.

One of the characters in the play of "Sweet Lavender" moralizes thus: "Blame, blame, always blame, but praise—oh, no, never! Much may be done by kindness." Leading gets more willing and reliable work out of men than driving ever can do. Encouragement by kindly advice and sympathy, or by material help and backing up, produces a better spirit for effort than hostile censure or faint praise. Constructive criticism enlightens the difficulties or reduces the defects of the person or thing criticized, and points to a better road than the cul-de-sac indicated by mere sterile and depressing denunciation. There are times in the life of a profession when the upbraiding voice should be heard and there are threatening innovations (such as the employment of unqualified assistants) which need countering, and when all those who have a love of right and justice must speak out boldly in defence of the true interests of the body corporate to which they have the honour and privilege to belong. We do not wish to assert that the sympathetic and encouraging note is always justified. The whole labour field of investigation, teaching, and practice, however, will be best cultivated by co-operation and understanding among clinicians, laboratory workers, practitioners, and teachers. An intuitive sympathy among the varied departments of effort is essential to true progress, to enable the profession to give its best service to the country and to keep abreast of the ever-advancing march of science. To justify its existence a body of scientific men must always be striving to throw more light on the problems of disease, to produce the best possible results in grappling with them, and to show marked ability in overcoming them. When an individual or profession has done the best in a field of labour concerned, they will advance all the more spiritedly and light-heartedly if they receive encouragement. We are so constituted that a pat on the back, a word of commendation, or a material reward will produce as good an effect on us in incitement to further action and per-

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severance as in the case of that very human mortal Dick Phenyll, a chief character in the play of "Sweet Lavender."

Among ourselves we have tried to encourage individual effort by establishing, through the help of giants among us, such awards for merit as the Jubilee Memorial and Bursary Prize, the Fitzwygram Prizes, the Walley, the Williams, and the John Henry Steel Memorial Prizes. Recently we are pleased to note that veterinary science has been recognized by the State in the granting of the award of a Civil List pension to the children of the late William Hunting. If the amount of this is not as liberal as some of us think it might have been, the stress of the times has to be taken into consideration, and in any case it is a landmark in the history of our profession. The searchlight of the War has done us good in bringing our services to the State into a prominence which they would scarcely have achieved otherwise, and another fact for our encouragement is the granting of the rank of Captain on joining the Army Veterinary Corps to those of our members of five years' standing in the Civil Services. But why is this concession limited to these men? Are there not others equally worthy?

We still think that the State might do more to stimulate the advancement of the profession in the fields of research, instruction, and education. When a true understanding of our desires and aims and a just appreciation of our efforts, with the limited advantages given us, are absorbed by those with influence in high places and by the holders of the places themselves, we shall then expect to receive our due and right position in the economic and scientific activities of the nation. Not infrequently an empty-headed politician or a pseudo-statesman runs our little body down and seeks to trample it in the mire. As a rule, the ignorance of this individual is only equalled by his "superior person" air. Men of this kidney are common to every land. They usually "lend a willing ear to uninformed assertions concerning the work of disinterested and competent public servants."

The truly paternal State will not only keep a look out for special merit in the ranks of those attached to it officially and reward them proportionately, but it will also cast a roving eye over all workers in our fields, and occasionally remember that "whilst generals may win battles, wars are won by the rank and file." The timely recognition of the special services of a lieutenant in the army of erstwhile civilian professional men will be appreciated as much as a large grant of money to a successful general.

G. M.

General Articles.

A PRELIMINARY NOTE UPON THE INTRA-DERMAL-PALPEBRAL METHOD OF MALLEIN TESTING FOR GLANDERS.

By the courtesy of the French military authorities, on July 9 a very interesting demonstration of the value of the above method of testing with mallein was given by Professor Douville (of the Lyons Veterinary School, now serving as a lieutenant in the French Army), in the presence of Brigadier-General Moore, Colonels Butler and Newsome, Majors Olver, O'Rourke, and Wadley, Lieutenant Hobday, and a number of other veterinary officers.

The results were so convincing, and this demonstration was so skilfully carried out, that it was at once decided to give the method a thorough trial in the British Service.

This method of testing with mallein has been for some time on trial in the French Army, and the results have been reported upon most favourably, so much so that, under war conditions, at any rate, it is probable that it will supplant the subcutaneous method almost entirely.

The chief advantages claimed for it are that the dosage is very much less, thus saving mallein, and necessitating less material to be carried or sent about the country (a very great asset where thousands of horses have to be tested); secondly, the reaction is so pronounced that a decisive opinion can be given with much more confidence than one is able to sometimes do by the subcutaneous method; thirdly, there is no need whatever to take any temperatures, and the test can be carried out on feverish animals and in any surroundings.

An ordinary small 1 grm. syringe (Pravaz or other pattern), with screw piston graduated to $\frac{1}{10}$ c.c., is used, and the needle should only be about $\frac{1}{2}$ in. in length.

Of mallein, as at present supplied for the British Army Service, instead of a dosage of 1 c.c. only 2 minims are necessary. In the French Army mallein is obtained from the Pasteur Institute, and a special concentration of 1 to 3 (malléine diluée au quatrième pour intra-dermo-reaction) is prepared.

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FIG. 1.

Side view showing the reaction after injection into the lower lid of a glandered horse.

FIG. 2.

Front view of a "reactor." Note the muco-purulent discharge from the inner canthus.

The injection is made into the skin of the eyelid, the lower for preference, although either will do.

In the majority of horses the head is merely held by an assistant; or, if the animal is at all restless, a twitch may be applied.

The operator, standing by the cheek, with the syringe in the right hand, carefully inserts the needle parallel to the eyelid into the layers of the dermis itself, and not subcutaneously (although no harm results, even if it does penetrate into the subcutaneous tissue), holding a fold of the eyelid between the finger and thumb of the other hand. The piston, the dose having been previously graduated by the screw upon it, is then pressed and the dose inserted.

The result is as follows:—

In healthy animals the eyelid remains unchanged, or becomes only very slightly swollen between the second and sixth hours, this swelling disappearing about the twelfth hour. In a glandered horse there is a very characteristic reaction. This takes the form of severe and extremely sensitive œdema of the eyelid, accompanied by a more or less profuse mucous discharge, the conjunctiva being bloodshot and the eye more or less closed.

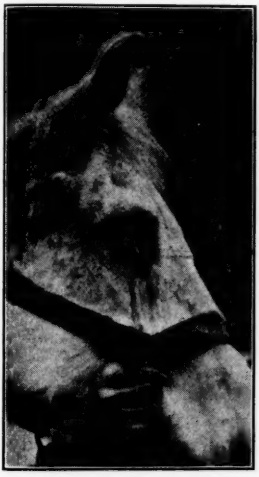

FIG. 3.
A typical reaction (lower lid injection).

The reaction is readily visible about the ninth or tenth hour after the injection, and is at its height between the twenty-fourth and thirty-sixth hours, remaining sometimes for three or four days.

In the event of a doubtful or incomplete result, an injection of 2 minims into the other eyelid may be given forty-eight hours later.

The swelling will persist in a glandered horse for three or four days and then gradually disappear.

Hypodermic injections in the usual site in the neck can, if the operator wishes, be done at the same time as the injection into the eyelid, and in a glandered horse each will act equally well.

If the horse has previously had a subcutaneous mallein test, a delay of twenty days should elapse before resorting to the intradermal method.

Out of between 5,000 and 6,000 mallein tests made during the past eight months the intradermal test never failed, all reactors being proved on *post-mortem* to be glandered.

In almost every case there was agreement in result between the palpebral and the subcutaneous methods, but in a few instances animals were met with

FIG. 4.
A typical reaction (upper lid injection).

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which reacted definitely to the intra-dermal-palpebral test, but in which the hypodermic test in the neck was indecisive. In all cases the *post-mortem* examination proved the diagnosis based upon the intra-dermal reaction to be accurate.

ON THE EMPLOYMENT OF POLYVALENT SERUM IN VETERINARY MEDICINE.

By Monsieur L. CUVILLIER.

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Every time that a microbe penetrates a point of the body it produces a defensive reaction interpreted by an afflux of leucocytes, which, passing out of the vessels by diapedesis, move in great numbers to meet the invading element. Diapedesis is followed in the great majority of cases by phagocytosis of the germs which are for the most part surrounded by white cells. From then these suffer a very varied fate, according to the pathogenic value and the toxicity of the microbian agents which they have ingested; if the digestion of the atoxic or little virulent bacteria is effected normally, that of the pathogenic and toxic microbes is unrealizable, and the leucocyte does not delay at all to succumb to the action of the germ. White cells thus destroyed are lost for organic defence, for regeneration of the tissues; they constitute the figurative fundamental element of pus.

Antiseptic medication, so largely used to-day, proposes to destroy on the surface of infected wounds and mucosæ the organisms that multiply there. To this end it uses different chemical or physical agents, which all proceed by oxidation of bacterian protoplasm or by coagulation of this substance. But for those who know the very real resistance of bacterial protoplasm to different agents, it appears beyond dispute that before reaching the microbian element the antiseptic exercises its action violently on the cells of the wound concerned, and notably on those very young and fragile elements which co-operate in its repair, and violently also on the leucocytes whose chemiotaxis has been a long time established.

The opposition is flagrant between the artificial means of making wounds healthy, or of the protection of the tissues which represents the antiseptic medication, and the physiological process of defence and repair of tissuelary lesions.

A well-thought-out medication ought at least to favour the play of physiological functions, if not to assure and determine it, to hasten its manifestation. To this point respond the researches of Messieurs Leclainche and Vallée, presented for the first time by these authors in a note to the "Académie des Sciences" in March, 1912. According to these authors, the ideal of a reparative medication of wounds ought to have as its aim and end the determination of a *total and useful phagocytosis* of germs encountered there. Only the "sensibilizatrices," specific antibodies of sera of animals hyper-immunized against pyogenic microbes, are capable of provoking it. And the method offers, moreover, evident interest, since the researches of Carrel, recognized already by R. Petit, on bathing with a serum, a highly physiological element, to bring about repair of tissues.

Having personally employed this serum for two years in various hospital services of Paris for the treatment of infected wounds, and having obtained in all cases an almost immediate diminution of suppuration, followed by rapid repair of the tissues, we have thought that its application in veterinary medicine would produce the same effects as in human medicine. In animals wounds are largely infected and protected with difficulty, also in many cases tissues reform slowly, hence prolonged disuse of the animal.

Bacteriological researches carried out on various lots of pus have revealed in the majority of cases the presence of various staphylococci, and rarely streptococci. The equine producers of serum being treated with the view of specially furnishing sensibilizatrices, the polyvalent serum ought, in order to produce its maximum effect, to be in direct contact with the tissues infected. When dealing with penetrating jagged wounds one endeavours largely to trim away the mortified tissues; this mode of procedure does not present any inconvenience, for repair is as clean in the depth of the wound as on the surface. When by reason of the anatomical situation of the lesion trimming is not possible it is necessary to make the serum penetrate into all the tracks, either by injecting or by means of tampons of gauze. Whatever the

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case, the wounds ought to be previously washed with the physiological water in such a way as to obtain as perfect a cleansing as possible without altering the cells.

The cases treated with the devoted help of veterinary assistant Monsieur Granmont, and M. Hugot, veterinary pupil, have been numerous [we hope in the next issue to give particulars of these cases.—Translator], and they bear principally on wounds situated principally in the region of the withers or limbs, wounds necessitating perfect cicatrization before the horse can be used.

Among the observations taken we shall note certain cases of wounds treated primitively with antiseptics, then with polyvalent serum, and others treated exclusively with polyvalent serum.

The history of the cases given is not only of interest in demonstrating the efficacy of polyvalent serum in the treatment of suppurating wounds in the horse; it confirms the specific nature of its established effects in human therapeutics. In their notes to the "Académie des Sciences" and "Académie de Médecine," Messieurs Leclainche and Vallée have already insisted and brought forward different arguments in favour of the specificity of the properties of their serum. Our *confrère* and friend Ramon has been able experimentally to verify this quality, and our clinical observations give him support of undoubted value.

Polyvalent serum acts on suppuration, and the infection of wounds, principally in favour of different antibodies; its happy action on the horse establishes its sovereignty.

Is it not a point of all the evidence that normal horse serum, if perhaps of some activity in different human and animal species, cannot exercise any favourable influence on the horse itself, which is apt to a spontaneous auto-serotherapy of its own lesions.

If this were so, the animal ought always to cure its own lesions without the help of any intervention. It is, however, to the multiple antibodies that it contains that polyvalent serum, indeed, owes its principal activity, and not at all to the sole physiological qualities which it partakes of with normal serum. This establishes the real superiority which its employment presents in human therapeutics. G. M.

OFFICIAL INSTRUCTIONS ISSUED FOR THE USE OF SPECIFIC POLYVALENT SERUM FOR THE DRESSING OF WOUNDS.

By Professors LECLAINCHE and VALLEE.

The Veterinary School, Alfort.

This serum, produced by horses immunized against the organisms of diverse suppurations (staphylococci, streptococci, coli bacilli, pyocyanic bacilli, &c.) and of gaseous gangrene (vibrion, septic, *B. perfringens*), according to the method of Leclainche and Vallée, possesses at the same time the advantages recognized in normal serum and those which result from the presence of *specific antibodies*.

By its *physiological qualities* the serum forms on wounds and inflamed mucosæ an isolating layer, and constitutes an occasional medium eminently favourable to the rapid regeneration of anatomical elements to the success of grafting, to the safeguard and regeneration of cutaneous flaps, muscular or mutilated organs (fingers, toes), which without it would require excision. It is a precious and incomparable help to conservative surgery. It diminishes pain and causes it to disappear (extensive wounds, burns).

By its *specific properties* the polyvalent serum ensures the phagocytosis of organisms; it modifies rapidly, then dries up suppuration, or hinders its development; by its action on anaerobes and microbes that favour their multiplication it avoids indirectly the formidable complications of gaseous gangrene.

In contradistinction to antiseptics which paralyse and coagulate at the same time the microbe and the cells of the tissues, the serum protects the latter and affects the microbe only.

Employed in dressing of infected wounds, it realizes a physiological antisepsy expressed by immediate modification of suppuration and its progressive disappearance, followed by hasty cicatrization.

Used as lavages and dressings as a *preventive* in surgical operations susceptible to post-operatory complications (soiled or infected serosa, progressive gangrene) it brings about normal repair of the lesion.

MODE OF USE.

The employment of serum *exclusive of all other antiseptic medication* is carried out as follows:—

(1) Practise a complete lavage of the surfaces to be treated, with a boiled, lukewarm solution of sodium chloride 9 per 1,000 in water, distilled for preference.

(2) According to the case, apply on the wound layers of simple sterilized gauze soaked in serum, or introduce a tampon soaked in serum into the fistulous tracks or cavities, or inject the serum without dilution.

(3) Apply a dry protective dressing.

(4) Renew the dressing of polyvalent serum as often as necessary and according to the indications of each case. Prolonged use of the serum does not lead to any anaphylactic or other accident.

(5) Each flask issued or ampoule opened ought to be used immediately. Only contraindication: cerebral surgery.—*Revue générale de Médecine veterinaire*, July 1, 1915.

G. M.

THE MAMMALIAN CÆCUM.

BY WALTER STAPLEY, M.R.C.V.S., M.D., D.V.Sc.
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IT is to be regretted that academic authorities have stated that bears have lost the cæcum by retrogressive changes, that the double cæcum of birds is fit for direct comparison with the mammalian cæcum, and that the vermiform appendix is a lymph gland and not a vestige of the cæcum of ancestral man; for not only do these erroneous statements serve to confuse the history of the cæcum, but they divert the study of the subject from its proper sphere, the consideration of the differentiation of the simple gut into small intestines and large bowels.

The evolution of the large bowels expresses the adaptation of the simple gut to the digestion of coarse vegetation, such as grass and leaves. In those types through which mammals have passed, fish, amphibian, and reptile with less than seven neck bones, the simple gut extends from the stomach to the vent. In none of these types has the cæcum been evolved. In a number of mammals a like cæcumless state exists; sometimes these cæcumless mammals are referred to as showing a reptilian type of intestine. In all other mammals the simple gut forms the small intestines and the large bowels.

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As such cæcumless mammals as bears, the great ant-eater, the Tasmanian devil, and the native wild cat of Australia are all able to convert proteids, fats, and carbohydrates into mammalian tissues, it is probable that the cæcum has been evolved to meet physical changes in the food. As comparative anatomy demonstrates that the cæcum is developed only in those mammals that eat, or have eaten, vegetation; the probability that the cæcum exists to deal with the hardness which vegetation acquires through growing in our, more or less, dry atmosphere, bears something akin to an established fact. This fact is established by physiologists discovering that cellulose is digested in the cæcum.

The function of the simple gut is to absorb the products of gastro-duodenal digestion and to carry the residue of digestion to the vent. After the simple gut has been differentiated into small intestines and large bowels, the function of the small intestines is that of the simple gut, plus the carrying of cellulose-containing ingesta to the cæcum. The necessity of clearing the small intestines of bulky ingesta, so that it may carry out its proper function without hindrance, leads to hypertrophy of the musculature of the ileum. This reaches its highest development in the ileo-cæcal valve. The function of the ileo-cæcal valve is to clear, in association with the muscles of the ileum, the undigested ingesta from the small intestine, and through the tonicity—that is, the characteristic feature of involuntary muscle —to act as a valve and close the ileum against regurgitation from the cæcum.

The necessity that compelled the early mammals to roam the earth in search of food found them cæcumless. Those that continued to find food, such as the reptiles eat, have never evolved the cæcum; those that were compelled to eat vegetation evolved the large bowels; and, under some circumstances, also the paunch. Food arriving in the early mammalian stomach set up commotion in relationship to the strangeness of its physical characters. Thus, when vegetation was eaten slowly and well masticated, it was examined by the stomach; and that which was unsuitable to its purpose was cast, undigested, into the duodenum, the duodenum being even more inconvenienced than the stomach by the intrusion of ingesta that warred with its function, hurled the undigested ingesta to the jejunum, which, for the same reason, hurled the material into the ileum, where a like process occurred. The emptying of the small intestine is necessary to preserve its function, one of the most important of all digestive processes; the means by which the function of the small intestine

is preserved is the hypertrophy of the musculature of the small intestines, the cæcal end of which protrudes into the cæcum, tap-in-barrel fashion, as described by anatomists, but far more like the manner in which the neck of the uterus is pushed into the vagina.

The drive of the muscles of the small intestine ceases abruptly at the ileo-cæcal valve. The force of this drive is expended on the lax walls of the cæcum; these walls it dilates through the co-operation of sphincteration of the colon, which dams the outflow of the cæcum. Unlike the sphincter of the stomach, the pylorus, colic sphincteration is fixed to no special location; its position is determined by the amount of ingesta that it is necessary to imprison so that the body may be nourished. The position of the pylorus is fixed by the ducts of co-operating glands, the pancreas and the liver.

Not only is coarse undigested vegetation hastened through the small intestines into the cæcum, but water is likewise carried to the cæcum. Large quantities of water are necessary to the digestion of cellulose. The weight of water and vegetation pulls the simple mesentery by which the simple gut is suspended from beneath the spine into distorted shapes; it also drags the cæcum across the outlet of the ileo-cæcal valve.

The cæcum, being a differentiation of the simple gut, contains the same tissues as the small intestine; they are, from within outwards, mucous coat, circular muscular coat, longitudinal muscular coat, and peritoneum. The muscular coats of the alimentary tube are the slaves of digestive function; as needed, they become active or passive. The activity of the ileum is followed by the passive state of the cæcum, that permitted its walls to be stretched to that thinness, wherein the drive of the muscles of the cæcum can only move onward its contents with great slowness. During the digestion of cellulose that takes place in the dilated walls of the cæcum gases are generated. Intestinal gases play an important part in the evolution of the cæcum. After this organ has been formed by the force of the muscles of the ileum dammed against the walls of the cæcum by colic sphincteration, the cæcum is apt to have the arrangement of its muscular walls upset by internal pressure of ingesta and gas. As the walls of the bowel are distended by flatus, the outer muscular coat ruptures in various ways; between the rents the internal muscle, mucous coat, and ingesta are forced, and the external torn muscle is driven together to form muscular bands. When the cæcum is banded in the region of the ileo-cæcal valve and plain towards the apex, it will, if it subsequently undergoes involution, form a vermiform appendix. The vermiform appendix

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is the vestige of a cæcum that was ruptured in the region of the ileo-cæcal valve and unruptured towards the apex.

In the *British Medical Journal*, December 7, 1912, Dr. Arthur Keith is reported as saying: "In bears the great bowel has undergone retrogression." There is but one thing which supports this idea, and that is that all the mammalian species have arisen from a common mammalian ancestor. In the bears there is no structural evidence of any retrogression of the large bowel having taken place. The common ancestor is supposed to have had a rudimentary cæcum that has been transmitted to all mammalian species by heredity. Both ideas are crude; before critical analysis they display no harmony with the fundamental principles of heredity or of evolution. The relationship of fixed-type to heredity and the way fixed-type is established by evolution both indicate that each of the mammalian species acquired its individuality back in the invertebrate stage. If that be so the mammals have sprung from as many sources as there are mammalian species. The anatomy of the large bowel clearly indicates that the mammalian species do not arise from a common ancestor. After a cell mass has acquired individuality it assumes animal shape according to the control of cosmic energies by which it is beset. Morphology is not something that emerges from a call to control animal shape; it is the effect of energies upon the organism that have so impressed it as to become latent in its cells, and thus they are transmitted by heredity. Heredity is nothing more than the transmission, from one generation to another, of latent energies that have been established by past activities. Biological evolution is as much a part of general evolution as heredity is part of biological evolution.

Those mammals that have undergone retrogression of the cæcum demonstrate that bears have not undergone that change; they are man, anthropoid apes, and wombats. By exactly the same kind of reasoning as that which asserts that bears have lost the cæcum it may be said that man has lost the carapace; for man and the armadillo arose from the mythical common ancestor, which had, in addition to its rudimentary cæcum, a rudimentary carapace which it transmitted to man and the armadillo.

Dr. Keith further says: "I have come to the conclusion that there is always a functional sphincter at the junction of the small intestine with the large. It is present in the amphibian bowel, the reptilian, avian, and mammalian. When the large bowel undergoes retrogression, as it has done in bears, the ileo-cæcal sphincter is the only visible structure which remains to mark the junction of the small intestine with the large." There is no sphincter at the ileo-cæcal valve, which is the junction of the

ileum with the cæcum, and therefore the junction of the small intestine with the large bowel. A sphincter in this position would destroy the function of the small intestine by damming ingesta upon its villi. No amphibian has a large bowel, neither has any reptile that has less than seven cervical vertebræ. The so-called ileo-cæcal sphincter of bears marks the junction of the absorbing and non-absorbing areas of the simple gut.

Dr. Arthur Keith introduces the ileo-cæcal sphincter after quoting John Hunter's remark: "If we could understand the use of the ileo-cæcal valve, then we should understand the uses of the cæcum." A valve is not a sphincter, and a sphincter is not a valve. The Greek word from which sphincter is derived means a clasp, a band; wherever a clasp or band is thrown round the alimentary tube a dilatation precedes it. Sphincteration and preceding dilatation are inseparable. The fact that there is not a single instance of a mammal with a dilated ileum proves conclusively that no sphincter exists at the ileo-cæcal valve. The Latin word from which valve is derived is not so clear in its application as anatomical and mechanical use has made it; a valve determines the direction in which currents shall flow; valves relieve congestion in front of them, sphincters make congestion in front of them.

John Hunter failed to understand the human cæcum because he did not know the law of vestiges; Dr. Arthur Keith has confused the action of the ileo-cæcal valve because he has failed to recognize the fact that the human ileo-cæcal valve is also vestigial. It has lost the function of driving coarse vegetation into the ileum ever since man applied fire to break up the hardness of vegetation, and more especially since man discovered how to transport the products of the world to one central market, from which they are distributed. The poor man of to-day lives on a nutritive diet that was denied a prince of a few centuries ago. The ileo-cæcal valve of man is a vestige of tissue that remains of those tissues that were built up to keep the small intestine of man free of coarse vegetation. The work imposed on the ileo-cæcal valve of the horse is so great that, with its associated muscles, it forms a tube so rigid that Major-General F. Smith believes that it shoots food direct into the colon. This view does not seem to fit the action of involuntary muscle; when in activity the terminal part of the ileum is not rigid, it is flaccid; food cannot pass through the ileum when it is rigid, for at that time its lumen is occluded. Food passes the ileo-cæcal valve much in the same way that a fœtus passes through the neck of the uterus. Of all animal structures there is only one comparable with the ileo-cæcal valve, and that is the neck of the uterus. In

the pig, which is an excellent example of an omnivora, the ileo-cæcal valve is well developed and extends well into the ileum. The vestigial nature of man's cæcum is displayed by the record of bismuth meals that have, with X-rays, been observed to regurgitate from the cæcum into the ileum. The fæcal vomit of man displays the fact that his ileo-cæcal valve does not prevent cæcal contents getting into the small intestine. Although abdominal disease is much more frequent and much more fatal in the horse than in man, regurgitation from the cæcum to the ileum is never observed in the many colics that kill the horse. The little resistance which the ileo-cæcal valve of the dog offers to regurgitation is shown by the fact that, by the aid of a preliminary dose of castor oil, an enema may be sent right through the alimentary tube, entering the rectum and emerging from the mouth.

In order that vegetation may be made fit for cæcal digestion, it is necessary that it shall be ground by heavy molars or broken up by maceration in the paunch. The arrival of vegetable food in the mammalian stomach initiated pre- or post-gastric modification of the alimentary tube, according to the amount of the ingesta. John Hunter failed to understand the relationship that exists between the cæcum and the stomach; thus Keith says: "John Hunter was familiar with the fact that the cæcum was small, the colon short, and the fæces of thin consistence in carnivora, while the opposite was the case in vegetable feeding animals. Further, he recognized that animals with perfect gastric digestion, such as ruminants, had comparatively small cæca, while in others like the horse, with an imperfect gastric digestion, the cæca were large. He therefore recognized a very important fact that there could be an interchange of function between stomach and cæcum." Whether John Hunter really believed that which is written must be doubtful, for it is strange to account in any other way than the difficulty which we all experience in making our language express our meaning, for the marvellous information that bone-eating carnivora void cow-pats, and that the droppings of grass-fed cows have no splash. It is an unscientific statement that says the stomach of the horse is less perfect than that of a ruminant. The horse's stomach is much more highly developed than the stomach of any ruminant. It is quite evident that Keith has not discovered that Hunter mistook rumen, reticulum, and manyplies for stomach. It is quite true that there is a strong relationship between the function of the paunch and the cæcum; but that important interchange of function between cæcum and stomach that Keith regards as a very important fact does not exist. The evolution of the paunch

and the large bowels expresses the inability of the stomach to carry out the work that they accomplish.

The evolution of the paunch was due to timidity and stupidity. Those early mammals that became ruminants had not sense enough to avoid destroying carnivora. Harassed, they acquired the habit of eating voraciously, and after a rapid meal they sought the seclusion of their lairs. Under such circumstances the stomach is annoyed by being stuffed to the destruction of its digestive function. It vomits. The body being in need of nutriment holds on to the nutriment which the vomit contains by dilating the pre-gastric tube. The rumen holds the bulky food which the stomach is unable to retain; the reticulum holds the water that is necessary to soften the mass in the rumen; the manyplies rejects all coarseness that offers itself to the stomach. The pre-gastric digestion of ruminants breaks down the hardness of vegetation and robs the cæcum of that work. Thus it naturally follows that the cæcum of ruminants has but slight development. The thinness of the intestines of ruminants is caused by the musculature of the paunch doing the work that in other animals falls on the muscles of the intestines.

Those early mammals that had sense enough to eat slowly, presented small masses of vegetation to the stomach from time to time; these were examined for material fit for the stomach to digest and for material that it had to pass on to cæcal digestion. Coarse vegetation is promptly expelled into the duodenum, from thence along the small intestines into the cæcum. The drive of the muscles of the small intestine ceases abruptly at the ileo-cæcal valve, and its force expands the lax walls of the cæcum. As they stretch they become thinner, and as they become thinner they have less muscular strength, and as such stand ever subdued by the superior strength of the ileum.

Cæcal work is constantly marred by comparison with the double cæcum of birds. Although it is a fact that birds which eat grass show considerable development of the double cæcum, the arrangement of the musculature of the walls of the alimentary tube of birds is so widely different that it is impossible to make any direct comparisons between the cæcum of birds and mammals. In the mammalian cæcum gas is constantly present; and gas in the double cæcum of flying birds is prevented by the structure of the gut of birds. Two cæcal authorities compare the double cæcum of birds directly with the human cæcum, Dr. Keith the cæcum of the ostrich, and Professor Berry the tiny double cæcum of the pigeon. These structures are no more directly comparable with the mammalian cæcum than the cock's comb is comparable with the forelock of a horse. It is a difficult matter to compare

any vertebrate, possessing many neck bones, directly with mammals.

The digestion of cellulose requires much water. The cæcum becomes loaded with vegetation and water, and by its sheer weight distorts the mesentery by which it is suspended. Accommodation of the enormous development which the large bowel undergoes, as an animal becomes a vegetarian, is only possible after the simple mesentery has been pulled out of recognition. The shape of the cæcum itself is due to peristalsis starting at that point that becomes the apex of the cæcum, the distension of the cæcal walls by the force of the musculature associated with the ileo-cæcal valve, and sphincteration of the colon.

One of the most interesting changes in the cæcum of the horse and man is the formation of muscle-bands. These interesting structures are seen only on the stomach and the large bowel; they do not occur on the small intestine. They are very rare on the stomach, occurring as they do in kangaroos, wallabies, and one of the Indian monkeys. They are common on the large bowel of mammals. They do not occur in fish, amphibians, and reptiles with seven and less neck bones. They are due always to the same cause: rupture of the external muscular coat by the force of gases within the gut. They are of particular interest in the formation of the vermiform appendix. When the cæcum of the horse was ruptured it tore clean down to the cæcal apex; this type of tear is extremely common in the various and many mammals that have undergone this change. It is the common type of tear amongst the monkeys. Torn in this manner, it is not possible for a vermiform appendix to form at the cæcal apex should the animal return to a food that does not require cæcal digestion, and which induces involution of this organ from disuse. The cæcal tear that produces a vermiform appendix is much more rare. It occurs in a loris and in one of the lemurs; it preceded the formation of the vermiform appendix in man, anthropoid apes, and wombats, the only animals that have the vermiform appendix. In these animals the cæcum is torn only in the region of the ileo-cæcal valve, the external muscle remaining intact at and towards the apex.

The cæcum of prehistoric man was plain until gases generated by the digestion of cellulose ruptured the external coat. These rents extended about half-way down the cæcum, from thence to the apex; the external muscular coat remained undamaged. The ruptures divided the cæcum into a banded and a plain part; the latter became the appendix.

Organs that perform those functions for which they were evolved remain of fixed type; therefore, so long as primitive man

loaded his large bowel with food largely composed of cellulose, the cæcum remained of fixed type. Organs that have ceased to perform those functions for which they were evolved remain persistently in atrophic structure and become vestiges. The light nutritive diet of civilized man requires no cæcal digestion, his cæcum is atrophic from disuse, and the vermiform appendix marks the remains of the apical part of the large cæcum of ancestral man.

Organs in disuse become suppressed or suffer extinction when they are submitted to hostile activities. The banded cæcum has been suppressed in man by the pull of the muscular bands of the colon. As the contents of the cæcum grew less, these colic bands drew the cæcum in the direction of the colon and atrophy took up the slack. The muscular bands of the cæcum deliver their pull at the junction of the banded and plain parts of the cæcum. When the cæcum has shrunk to that degree wherein the diameter of the lumen sets each and all muscle bands in opposition the apical part becomes shut off, except by a narrow channel, from the wide lumen of the banded cæcum. Thus the appendix is formed.

After the formation of the appendix the mesenteric band pulled it towards the ileo-cæcal valve. Following the extinction of the lower ends of the cæcal bands by the pull of their upper parts, the upper parts are in turn suppressed by the pull of the colic bands. The terminal segment of the cæcum is never submitted to the hostile pull of the muscle bands, either cæcal or colic; the appendix, being submitted to no hostility, will persist for ever or until some hostile force may arise that shall rub out the impression of those activities which ages ago so affected the germ-plasm that the remains of a lost function is transmitted by heredity.

The history of the human cæcum is clearly written in those cæcal variations that are described as types A B C D of appendix. The remarkable fact about these types is that A is not a type of an appendix; it is a funnel-shaped cæcum, a type that precedes the appendix.

Although the older anatomists established the fact that the vermiform appendix occurs only in man, the larger apes, and the wombats, this vestige has been attached, by many writers, promiscuously on animals. Thus Keith makes the startling statement that " it has never been suggested that the appendix of the koala, wombat, rabbit, lemur, or of the anthropoid apes is a vestige." As neither the koala, the rabbit, nor the lemur has a vermiform appendix the suggestion would be absurd. The wombat has a type D vermiform appendix, which is the most vestigial of all appendi-

cular types. Many of the apes—that is, the chimpanzees, ourangs, and the gibbons have a funnel-shaped cæcum in which the appendix is not yet formed. These animals have A and B types of the appendicular cæcum, and as such represent the earliest types of this cæcal vestige, and consequently the least vestigial. A man that has a type D appendix has a more vestigial appendix than a man who has a type B appendix, and what is also of some importance, he has an appendix that the surgeon has some trouble to find. Of the animals mentioned by Keith one, the rabbit, is responsible for more confusion about the cæcum than any other animal. It has lots of lymphoid tissue at the apex of its cæcum, and also a corresponding amount in a sac about the ileo-cæcal valve. With more hurry than judgment it has been claimed that the appendix has been evolved for lymphoid tissue, therefore the end of the enormous cæcum of the rabbit has had the vermiform appendix thrust upon it.

Richard Owen said: "The slender termination of the cæcum of the hare is glandular, like the vermiform appendix of man." It is a noteworthy fact that two likenesses which the old anatomists saw have grown into one and the same thing; thus the likeness which John Hunter saw between stomach and cæcum has been followed by Ellenberger, describing the cæcum as a second stomach; and the likeness which Owen saw between the lymphoid tissue in the cæcum of the hare, whose cæcum, by the way, is identical with that of the rabbit and man's appendix, has for a long time past been transformed into a vermiform appendix. As proximal dilatation invariably goes with sphincteration, so does a cæcal fundus invariably accompany the vermiform appendix. Neither the hare nor the rabbit has a cæcal fundus.

It is claimed that the vermiform appendix is a specialization of the cæcum for lymphoid tissue. This cannot be so, because the vermiform appendix of the wombat, the most typical vermiform appendix that occurs, is practically devoid of lymphoid tissue; and the rabbit, which has no vermiform appendix, has more lymphoid tissue at its cæcal apex than any other animal. Following my work on the vermiform appendix, wherein the fallacy of the lymphoid hypothesis was exposed, and which was discussed in a sub-leader in the *British Medical Journal*, Dr. Arthur Keith is reported to have said: "Twelve years ago Professor R. J. A. Berry, on the evidence he then produced, came to the conclusion that the appendix should be regarded as a specialized part—not a retrogade part—of the cæcum, and that is the conclusion which everyone must reach who makes an impartial survey of our knowledge of the comparative anatomy and of the evolution of the human ileo-cæcal region."

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It is not easy to review our knowledge, for it appears so different to the various reviewers. It is easier to review comparative anatomy and the evolution, involution, suppression and extinction of the cæcum. Professor Berry says: "The appendix is present in the opossum, rabbit, lemur, the anthropoids, and man, and whilst the vermiform appendix, as such, is only present in a few animals, I shall have occasion to show later that throughout the animal world there is a histological homologue of the appendix vermiformis of man." Sound comparative anatomy denies that either American or Australian opossums have the vermiform appendix; amongst the numerous opossums of Australia the cæcum is invariably well developed. None of the lemurs has a vermiform appendix; amongst primates they possess the highest development of the cæcum; one of the ring-tails has a cæcum showing a banded part and a plain cæcal part, and should cæcal retrogression take place in this lemur, it is certain to ultimately form a vermiform appendix. It is possible to follow the mechanism of the formation of the appendix with models constructed from this lemur's cæcum to the appendix of man.

The histological homologue, occurring throughout the animal world, of man's appendix is certainly an evasive structure. It compels us to believe that invertebrate organisms have a rudimentary vestige tucked away in invisibility. The rudiment of an organ resides in the necessity of constructing organs to perform some special function. The development of the structure occurs in proportion to the amount of the function that is done. A lot of confusion has always existed about rudimentary organs; as a matter of fact, the body shows no rudimentary organs; those that are called rudimentary are organs that have not been developed. A vestige is the remains of structure that was built up to perform a function that has ceased to be necessary. How the mind can be brought to conjure up a homologue of such a negation as a dead function passes understanding. There can be no histological homologue of a vestige, and the strength of Professor Berry's claim of a histological homologue lies in the fact that he denies that the vermiform appendix is a vestige.

Professor Berry's main contention is that "the vermiform appendix of man is represented in the vertebrate kingdom by a mass of lymphoid tissue situated most frequently at the cæcal apex." Why lymphoid tissue should require a piece of gut to be evolved for its protection is not announced; if we are asked to believe that the appendix has been evolved for lymphoid tissue, we may be excused if we make the logical, yet absurd observa-

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tion, that the throat has been evolved for lymphoid tissue because it harbours the tonsils. Then, again, comparative anatomy reveals the startling fact that throughout the mammals there is less lymphoid tissue towards the apex of the cæcum than there is about the ileo-cæcal valve. In this main particular the lymphoid advocates have ignored the facts of anatomy.

Professor Berry says: "Lymphoid tissue is the characteristic feature of the true cæcal apex throughout the animal kingdom." If Dr. Arthur Keith will make that impartial survey of comparative anatomy which he says compels an endorsement of the hypothesis that the vermiform appendix is evolved for lymphoid tissue, he will discover that comparative anatomy lends it no support, and further shows it to be wholly the product of imagination uncontrolled by the comparison of animal tissues. To say the vermiform appendix has been evolved for lymphoid tissue is on a par with saying that the vestige of the coracoid bone, the coracoid process of the scapula, has been evolved for phagocytosis because the blood which passes through this vestige contains phagocytes. It is fully apparent that the lymphoid function of the vermiform appendix is not the function that evolved the unbanded portion of the large cæcum of ancestral man, the structure that has shrunk into the appendix; the lymphoid function is quite a secondary affair that has nothing to do with the question of the vestigial state of the vermiform appendix. Professor Berry further says the amount of lymphoid tissue at the cæcal apex varies, most probably, but not certainly, with the varying diet of the animal. The rabbit has by far the greatest amount of lymphoid tissue at the apex of the cæcum, its food is entirely vegetarian; it is just as probable that the large quantities of lymphoid tissue that exist in the rabbit are associated with the productivity and rapid growth of these vermin, as it is that food is the operating factor. Other herbivora are devoid of lymphoid tissue at the cæcal apex; and although much is made of the lymphoid tissue in the apex of the cæcum of the rabbit, an undue silence has been preserved about the large mass of lymphoid tissue that resides in a sac by the ileo-cæcal valve of the rabbit. For the reasons cited by Professor Berry, he further says: "The appendix of man is not, therefore, either a vestigial remnant, or an organ in a state of retrogression, but is actively functional lymph gland." It represents a new idea of a lymph gland to regard typical gut wall, as the appendix is, as component parts of a lymph gland; also there is no reason forthcoming from those who claim that the appendix has been evolved for lymphoid function for ascribing to the lymphoid tissue of the appendix a function that differs

from the lymphoid tissue of the ileum and that of the rest of the cæcum.

A study of the mammalian cæcum displays many errors that are commonly held as fact. The vermiform appendix does not necessarily depend upon a meat diet. The thing, of which it is a vestige, was evolved to digest vegetation; the animal that has the most vestigial vermiform appendix is a pure vegetarian. Wombats and koalas are closely related; they differ in that the wombats have lost the cæcum, except the vermiform appendix; and the koala have about 8 ft. of cæcum. Originally both these animals lived on gum leaves; the wombat has given up this scented wood for food and taken to vegetable food of greater nutritive value. The place of the cæcum is ill-defined and there is no doubt that the colon of the wombat still performs cæcal functions.

The ileo-cæcal valve is rightly named. It is not a sphincter as has been many times stated. It is a typical valve, although the valve action is secondary to its prime function of emptying the small intestine.

The formation of the vermiform appendix depends entirely upon the manner the external muscle tears when subjected to pressure from within. It is an easy matter to build up mechanical models that display the formation of the vermiform appendix.

Finally, there has been too much nonsense talked about the evolution of the cæcum; these processes can only be followed by the forces that built up this organ. It is profitless to discuss the matter by theories of gemmules, chromosomes, or hormones, for all these things must ever be reduced to the energies that established them in the first instance. The physical side of comparative anatomy is a much neglected subject.

Lymphoid tissue has nothing to do with the formation of the vermiform appendix. Nor has lymphoid tissue any relationship to carnivorous and herbaceous habits. I have seen a number of wombats that have died in captivity from perforation of a lymphoid patch in the ileum, but never a case of appendicitis in this animal. It is unfortunate for man that he happens to have lymphoid tissue in his appendix; it is unfortunate that the susceptibility of this lymphoid tissue to engage in septic processes has led to the denial of the vestigial nature of the appendix. The basis of the lymphoid hypothesis is that lymphoid tissue forms the apex of the mammalian cæcum. Comparative anatomy displays the fact that lymphoid tissue does not form the cæcal apex, nor is the apex of the cæcum the most common site of lymphoid tissue in the cæcum; the amount of this tissue around the ileo-cæcal valve exceeds it.

EVERSION OF THE UTERUS.

By M. R. STEFFEN.

EVERSION of the uterus is always a very serious condition in cows. A complete eversion of the uterus presents a most discouraging spectacle, and in all veterinary practice there is no condition presenting an anatomical displacement of more formidable proportions.

There seems to be no fixed rule or combination of circumstances for the occurrence of this accident in cows. The condition has been seen in range cattle as well as in dairy cattle. One *possible* explanation of an exciting cause might be an exceptionally heavy, and at the same time, completely attached placenta which induces excessive post-partum, expulsive acts.

Aside from this I can point to no particular *direct* cause for this condition. In my experience most of these cases show eversion with the placenta firmly attached; now and then an eversion occurs in which the after-birth has come off. I can recall several cases to which I was called wherein the cow was straining abnormally, apparently in an effort to expel the secundines, which I am positive would have ultimately terminated in complete eversion of the uterus if their removal had not been promptly accomplished by manual extraction. In these cases eversion had already started; removal of the after-birth with proper flushing and swabbing immediately put an end to the trouble.

The mortality in eversion of the uterus is governed by two chief causes. One is shock; the other infection. But here again no fixed rule can be considered. Those of us who have seen many of these cases can recall deaths with the best of care and recoveries with the most outrageous handling. I recall one instance which was somewhat of a knocker to me when I first began practice. A farmer had a case of eversion of the uterus in a cow shortly before I located for practice. He "merely put it back in," hair, chaff, manure, and everything else with it. The cow recovered without missing a feed. Some time after I located in his vicinity he had another similar case, and, like a good fellow, called me. I spent ten or fifteen minutes cleaning up the mass with every antiseptic precaution and delicacy before replacing it and gave the cow every care. She died in two or three days. I remember a number of similar incidents.

However, this is no reason why we should allow ourselves to ignore scrupulous cleanliness in treating these cases. I merely mention it to show that recovery or death are not controlled by set rules. All we can reasonably say is that undoubtedly death was due to shock if the death occurred a relatively short time after the eversion took place, say, not more than ten or twelve hours. If the death occurred after a number of days the cow no doubt succumbed to infection. To attempt to prognosticate this cause of probable death is evidence of a lack of experience with these cases.

The treatment or handling of a case of this kind in a tactful, and at the same time, successful manner, requires the exercise of much good judgment on the veterinarian's part. In addition to this good judgment the veterinarian must "keep cool." Veterinarians who never use a cuss-word at other times usually "cuss" just a little when they are engaged in correcting an eversion of the uterus.

My plan of handling these cases is about as follows:—

I start with a hypodermic injection of morphine sulphate, from 4 to 6 gr. I have a twofold purpose in this morphine injection. The first is to overcome sensibility to a certain extent; the second is to counteract shock. Morphine is now considered the most scientific remedy for combating existing shock.

Having given the morphine injection, I proceed to remove the after-birth if it is still attached. When this has been accomplished an attempt is made to cleanse the organ itself. When I say "an attempt is made," I mean that I do not go to extremes in this part of the performance. I have a pail full of antiseptic solution into which I repeatedly dip the hands, slushing the contents wherever any foreign matter is seen on the parts. With a pail full of solution the cleaning can be accomplished thoroughly enough for all practical purposes. A clean sheet or rubber apron is placed under the uterus to keep it clean after the washing is completed.

Up to this point in the proceedings no difficulties of moment are encountered. Now they begin.

I make strenuous efforts to get the cow on her feet in every case after I get through cleaning up the uterus in those cases in which she is lying down. If she is standing up, of course, one is that much ahead. It is not always possible to get the cow

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up, but it pays to make considerable effort to get her to arise because, if one succeeds in bringing her to her feet, the reposition of the mass is rendered fully 50 per cent. easier.

During the time that the cow is being urged to get up, and when she is in the act of getting up, the uterus must be protected from again becoming soiled. This is best done by wrapping it entirely in the sheet or rubber apron. When the standing position has been attained have the cow moved in such a way that the fore-quarters will be considerably lower than the hind. This is not absolutely essential, but it helps to make the replacement easier.

With an attendant holding the tail out of the way and another man supporting the mass in the sheet or apron, the veterinarian begins the inversion by firmly grasping around the portion closest to the vulva with both hands and forcing it firmly, yet not roughly, into the vulva. At the same time the attendant holding the pendant portion of the mass should "follow up" with it. When the veterinarian has the portion in his grasp forced into the vulvar opening he must not release his grip at once, but slowly, with a sort of "feeding in" motion, and all the time holding in place by forward pressure what he has already replaced, he grasps again with both hands. Sometimes, if the cow strains severely, only one hand at a time is changed for a new grasp. This is repeatedly gone through until enough of the mass has been pushed in so that the attendant finds he has nothing left to hold. The veterinarian now places the doubled fist of one hand in the centre of the mass still outside of the canal and by appropriate pressure completes the *in*version, following in the full length of his arm and straightening out the "kinks" as much as possible. The pushing, during the entire process, must be done during the straining *intervals;* that is, while the cow is in the act of straining the veterinarian holds his ground. Then, just at the moment when the cow relaxes from each strain, is the time to accomplish something.

This I have found the best and safest method for inverting an everted uterus. I have tried other methods, such as have been recommended from time to time by various writers, but find this is the best.

If one fails to get the cow on her feet he is compelled to accomplish his object in a very awkward and tiresome position,

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and usually, to complete the reposition properly, must lie flat. Besides, the resistance to inversion is greater in the recumbent position. In the standing position the last portion of the mass literally falls into place.

In some cases matters are expedited considerably by smearing the vulva and its surroundings thickly with vaseline.

When inversion has been accomplished nothing in the line of a retaining appliance is necessary if the cow is standing up at the time. Straining after reposition is usually due to "kinks," and will not occur if the cow is standing at the time of the replacement. If the cow is down at the time of replacement it is a difficult matter to properly straighten these "kinks" and straining usually occurs.

Even in the latter cases I use no retaining appliances. I make every effort to get the cow on her feet as soon as the organ is in place and then have her placed with the hindquarters raised.

Sutures through the vulva, rope trusses, and other appliances have little value. I never use them. When a cow strains after I have replaced the mass I know that there is still a portion of it being pinched by a partial inversion. If it cannot be reached with the hand and forced into normal position, the best plan is to pump the cavity full of warm antiseptic solution. The straining will stop as soon as the "kinks" straighten out.

Tonics are to be given as after-treatment, and *always* a prophylactic dose of mixed bacteria to forestall infection. The treatment of various complications or sequelæ is left to the professional judgment of the attending veterinarian.—*Amer. Journ. of Veterinary Medicine.*

Clinical.

PARTURIENT LAMINITIS TREATED WITH AUTOGENOUS VACCINES.

By WILLIAM SCOTT, F.R.C.V.S.
Bridgwater.

Laminitis following upon parturition must always be looked upon as a serious condition, therefore any line of treatment adopted with the view of cutting short the disease and limiting the inroads to organic changes which are liable to follow must always form welcome material for the consideration of practitioners. We all know how unsatisfactory it is after succeeding in allaying the constitutional disturbances when the case "hangs fire" and we are confronted with grave organic changes developing within the hoof, which practically means the future working utility of the patient is in jeopardy. In those cases which run a very acute course the protective mechanism of the animal's body is so thoroughly thrown out of gear by the aggressive onslaught of the bacterial invasion that Nature seems unable to recover herself, and the patient soon dies. These cases begin primarily as an acute *auto-intoxication*, and as such may end, or they may be followed up by an *auto-infection*. In either case the protective forces are so paralysed that the natural responses to bacterial aggressivity are not forthcoming, or if at all, only in an incompetent manner, and instead of bacterial invasion acting as a stimulant the opposite condition becomes evident. This state of affairs may be due to a high degree of virulence of the causative bacteria on the one hand, or a low protective index of the patient on the other at the time of invasion. There are several factors at play in the production of parturient laminitis, but if we could obtain a completely sterile womb prior to and after parturition and until that organ merges into complete passivity, we should hear little of this condition in breeding mares.

In those cases of retained placenta a state of contractile inertia exists in the womb, and if the foal is dead born or weakly plastic adhesion exists between the womb and placenta, and I believe this latter condition is brought gradually about during pregnancy through an altered condition in the maternal blood consequent upon an attack of strangles, influenza, or similar

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specific diseases. What this alteration is I am not prepared to say, but I have noticed in some of those cases there exists an abnormally high *calcium content*, and that material improvement has followed the injection and administration of decalcifying drugs. In parturient laminitis chemotherapy has pronounced limitations, for really after keeping the eliminative channels well flushed to rid the system of toxins and the irrigation of the womb, the fountain of source of these toxins, we can do but little more. These, however, are very important tenets, which brook no neglect on our part. Vaccine therapy offers seductive prospects, if adopted early, for the following reasons: (1) The causative organisms can be easily obtained from the womb without the risk of alien introduction. (2) The womb being a highly vascular organ, the immune bodies, after elaboration consequent upon vaccine stimulation soon reach the focus of infection. (3) The accessibility of the womb places us in a position that we can stimulate the osmotic flow of immune serum through the uterine walls. This can be brought about by the injection of fluids several degrees higher than the present body temperature, dissolved in which are lymphagogues, such as sodium citrate or even common salt. Whether we confine our energies to the use of vaccine therapy or chemotherapy, the primary object we must always have in view is to conserve the animal powers of resistance and to reduce the subsequent risk of organic changes developing within the hoof. Vaccine therapy, if adopted early, holds out the best prospect of success in these cases.

Case 1.—A seven-year-old mare with a bad previous history. As a foal she had joint evil. At 3 years old she aborted after a sharp attack of strangles. At 4 years she developed rheumatoid arthritis, elbow, shoulder and knee, eventually making a good recovery. At 5 years she had a foal which died when a week old from joint evil—a significant fact. Some months later she developed canker in all four feet, and after being cured from this she was put to the stud. In due course she was delivered up to date of a dead foal, *post-mortem* examination of which revealed extensive blood changes. The placenta was retained for six hours and then cast, the left horn of which looked very unhealthy, the right healthy. The mare was in good condition, feeding, temperature normal, &c. Twenty-four hours later her temperature went up to 105° F. She began to blow and walk

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very stiffly. The same evening marked symptoms of acute laminitis had set in. At this stage a sterile tube was taken into the womb as far forward as the hand would reach and some materies morbi collected, taking care that during the process of withdrawal no alien bacterial contamination took place. On the following morning the patient was much worse, her temperature registered 106° F., appetite in abeyance, profuse perspiration, blowing heavily, and was made to move with the greatest difficulty. In the meantime I obtained a pure culture, the organism being a Gram-negative micrococcus, morphologically resembling the *M. catarrhalis* in man, and similar to the one I have isolated in certain cases of nasal catarrh in horses and mules.

From this culture a bacterial vaccine was made, slightly attenuated by heating for thirty minutes at a temperature of 40° C. Two cubic centimetres of this vaccine was injected in the neck containing 1,000,000,000 bacteria. Twenty-eight hours later the temperature was registered at 103·3° F., respiration 24 and pulse 79 per minute. The patient had drunk a fair amount of barley water, had eaten some grass and a little bran, but was made to move with difficulty. Forty-eight hours after the first injection was given another was injected, the 2 c.c. containing 2,000,000,000 bacteria suspended in a saline emulsion containing 3 per cent. trikresol. The following day the patient was walking much better, her temperature was 102·3° F., respiration normal when standing quiet, and pulse 60 per minute. Forty-eight hours later a third injection was given, the antigen this time being 2,000,000,000 live bacteria suspended in sterile saline solution. In thirty-six hours the patient was still improving, although the temperature registered 103° F. and the pulse 65. Great improvement was noticed in the walking; in fact, after a few yards the mare walked nearly normal.

From this date the mare made an uneventful recovery. Abscesses formed at the seat of the last two injections, but which were of no account.

Some time later this mare died from acute pneumonia. *Post-mortem* revealed, in addition to the lung affection, concentric hypertrophy of the heart and an old-standing atrophic condition of the liver, which was studded with numerous old abscess cysts. It was the smallest liver I have ever seen, and was only a few pounds in weight.

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Case 2.—A ten-year-old cart mare with retained afterbirth ten hours, removed carefully; took materies from the womb and irrigated the organ. The mare went slightly stiff, her temperature was 104° F., respiration hurried, membranes injected and icteric, womb very flabby and containing a large quantum of tenacious reddish-grey material.

The causative organisms were *Bacillus coli communis* and *Streptococcus brevis*. The latter was grown with difficulty and only on blood agar. Further, the former were in great abundance in the materies compared with the latter, the ratio being about 15 to 1. An alternative vaccine was injected; the emulsion was heated for forty-five minutes at 30° C., the dose being 4 c.c., containing 1,000,000,000 streptococci and 1,500,000,000 *B. coli.*

The following day the mare was about the same. The seat of inoculation was swollen and painful.

Sixty hours after the first injection the patient was given another dose of vaccine, the strength being 1,000,000,000 streptococci and 2,000,000,000 *B. coli* suspended in 4 c.c. of normal saline solution.

Two days later the patient was walking much better, the temperature normal, appetite moderately good. From this date progress was steady, no further injections being given. Abscesses formed at the seats of injection. These were lanced, healing taking place slowly.

Case 3.—A hunter brood mare gave birth to a dead foal; placenta retained twelve hours, the temperature 104·4° F., respiration 32 per minute, pulse 73 per minute; could scarcely move.

Diagnosis: Acute laminitis. Causative organisms: Streptococci and *B. coli communis*.

A stock vaccine of Streptococcus with coli was injected forthwith: 500,000,000 streptococci, 1,000,000,000 *B. coli*, held in suspension in a 5 per cent. trikresol solution. Forty-eight hours later an autogenous vaccine was administered: 100,000,000 streptococci, 1,500,000,000 *B. coli*, held in suspension in normal saline solution. Thirty-six hours later the patient was greatly improved, although she was very stiff. From this date both hocks began to swell, simulating rheumatoid arthritis, and entirely masking the foot lameness. She appeared to walk much better, however, on her fore feet.

The following day her temperature went up to 104·3° F., and she was in evident pain. Fifty cubic centimetres of anti-streptococcus serum was injected, to which I added sodium oleate and acid boric. The following day the temperature had gone down 3°, the patient walked much better, began to flex the hocks, which were not so painful, although just as much swollen. I now injected a pure virulent emulsion of streptococci 1,000,000,000 with *B. coli* 1,000,000,000. A small abscess formed at the seat of the second inoculation, but none at the third—a rather significant point, probably due to the bacteriotropic condition set up by the serum.

The hocks were blistered, and although slightly enlarged, the normal articular movements returned in due course.

General Treatment.—The bowels were unloaded at the outset, the kidneys and skin flushed by the exhibition of turpentine and salicylic acid, the womb irrigated with hot water—the temperature being several degrees higher than the patient's registration—and dissolved in which were acid citric, acid boric, and sodium chloride.

In *Case* No. 1.—Poultices and slings were used, also uterine pessaries and normal saline injections.

In *Cases* Nos. 2 and 3.—No poultices, slings, or pessaries.

Observation.—Upon the results obtained in only three cases it is impossible to dogmatize, but from experience gained on the value of vaccines in other uterine cases and the agreeable way many cases respond to the vaccine stimulus, I venture to think a good prospective lies ahead of the vaccine therapist in this particular fluid. To obtain the maximum benefits the causative bacteria must be isolated, and the treatment must be carried out early; failing this, grave alterations take place in the blood serum, followed by effusion from the small capillaries, blood-vessels of the feet, and the deposit of lymph between the hoof and pedal bone, which is liable to end in structural disorganization and other sequelæ well known to the practitioner. It will be noted I have used for my vaccines living bacteria in those cases and in other selected cases, both as prophylactic and curative vaccines. I have been using them for fully a year. From these I have obtained no harmful results save local abscesses at the seat of inoculation, and the antigens thus prepared exercise more pronounced activating properties over the immunizing mechanism than when they are subject to heat or powerful antiseptics.

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Canine Clinicals.

A CASE OF PERFORATION OF THE AORTA BY *SPIROPTERA SANGUINOLENTA* IN A HOUND.

By T. S. TIRUMURTI, M.B. & C.M.
Assistant Professor of Pathology, Medical College, Madras.

"Damsel." Suddenly she was off colour on March 6, 1914, and died the same night. She was one of the pack of Madras Hounds. At the request of Major T. H. Symmons, I.M.S., I did a *post-mortem* examination on her to find out the cause of her sudden death. The examination was conducted the next morning at 10 a.m.

The animal was well nourished. *Rigor mortis* was present, and there was no *post-mortem* staining. Nothing abnormal was noticed on opening the abdomen, except that the organs were paler than normal and the diaphragm was depressed below its usual height on both sides. On opening into the thorax both pleural cavities were found filled with a large amount of dark-red blood, and the lungs collapsed. The mediastinum was distended with infiltrated blood, and the parietal layer of the pleura, which formed the lateral wall of the mediastinum, was ruptured on both sides from the level of the sixth to the eighth dorsal vertebræ. Clot and liquid blood were seen through the rent. A firm nodule was felt at the lower end of the œsophagus.

The pericardium contained a small amount of clear serous fluid. The heart was normal in size, and its cavities, valves, and orifices were normal. The lungs were collapsed, otherwise nothing abnormal was seen in them. After the removal of the heart and lungs, the contents of the posterior mediastinum were removed entire.

Attached to the anterior wall of the lower end of the œsophagus was an ovoid tumour about the size of a walnut. On section this tumour was found to be of a fibrous nature. Small cavities were seen in the meshes of the fibrous tissue containing numerous reddish worms coiled up together. At one point the mucous membrane showed a minute perforation. Here the parasites were close beneath the mucous membrane. The muscular coats of the œsophagus extended over the surface of the mass, so that most of the fibrous tissue formation had taken place round the worms deep to the muscular coat. It appeared

as though the worms were in an active condition of migration. One of them was seen to penetrate the anterior portion of the

FIG. 1.—Showing the worm penetrating the anterior portion of the tumour.

tumour (fig. 1). The perforation in the mucous membrane of the œsophagus appears to be the result of similar activity.

On opening into the thoracic aorta the inner coat of the vessel was found thickened, dark in colour, and at one point perforated. Some clot was present round the perforation. On its removal a portion of a reddish worm became evident lying in the opening (fig. 2). A portion of another was seen to the right lying below the inner coat, which was removed. Behind the perforation was the fibrous verminous nodule of the œsophagus described above.

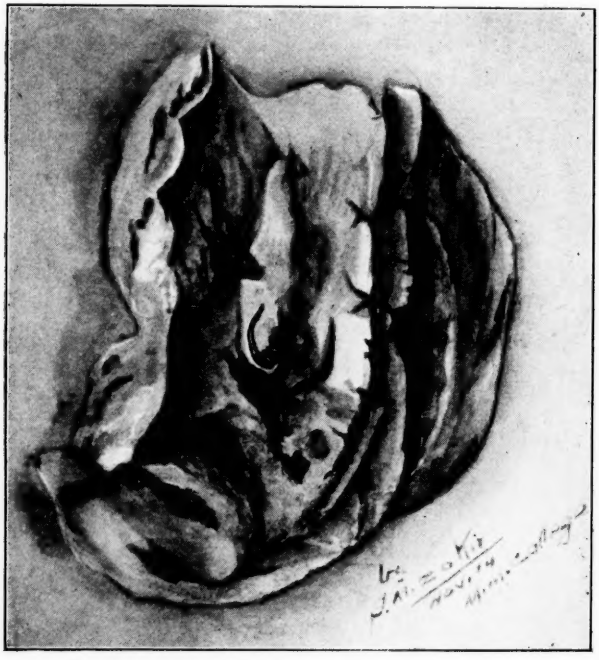

FIG. 2.—Showing another view of the worm *in situ*.

All the other organs were normal. Some of the worms were removed for purposes of identification. The worm was reddish in colour and from 3 to 5 cm. long, and accorded in its anatomical details with the description of *Spiroptera sanguinolenta* (Rud.) by Neumann.

This parasite is said to be common in China, Brazil, and Italy. I am told that many cases of this parasitic infection occur but are

not reported from India. Lewis, at Calcutta, has frequently seen in dogs nodules in the aorta resulting from *S. sanguinolenta*, which he called *Filaria sanguinolenta*. Megnin, Chauvrat, Perroncito, and Caparini are said to have witnessed dogs dying suddenly from hæmorrhage owing to rupture of the artery, the walls of which had undergone atheromatous degeneration. The rarity of such a complication and the absence of reports of many such cases, at least from this part of India, have induced me to record this interesting case.

My thanks are due to Captain R. E. Wright, I.M.S., for permission to report the case, and to Mr. S. M. Zakir, artist, Madras Medical College, for the plates, which he kindly painted for me from the specimens preserved in the college museum.

A CASE OF PRIMARY MALIGNANT DISEASE OF THE LIVER IN A HOUND WITH SECONDARY VISCERAL DEPOSITS.

By T. S. TIRUMURTI, M.B., C.M.

Assistant Professor of Pathology, Medical College, Madras.

"TRINKET." *Clinical History.*—The liver and spleen were enlarged. She was off her food. The blood examination was negative. The lungs were normal. Half the usual dose of neo-salvarsan was injected, as the animal was suspected to be suffering from piroplasmosis. The reaction was slight. The evening temperature on the day of injection rose to 102·2° F. She became very thin and anæmic. Costal spaces were retracting. She showed signs of respiratory trouble in the end, and died eleven days after the injection of neo-salvarsan. There was no nasal discharge.

The *post-mortem* examination was conducted by me at the request of Major T. H. Symmons, I.M.S. The animal was poorly nourished. *Rigor mortis* had passed off. The muscles were pale. The peritoneal cavity contained a large amount of clear blood-stained fluid. The liver was enlarged and showed numerous raised growths. On opening the thorax both pleural cavities contained a large amount of clear blood-stained fluid. Pericardium contained a small quantity of clear serous fluid.

Heart was normal in size. Its valves and orifices were normal. The heart muscle was a pale brown colour and firm in

consistence. The lungs were pale, but slightly moist on section, and firm and elastic in consistence. There were no areas of consolidation. Crepitations were felt throughout. A few small whitish, subpleural, secondary deposits were seen under the parietal pleura on the right side.

The spleen was only slightly enlarged, soft and flabby, and showed numerous raised whitish deposits ranging from a pin's head to a pea.

The liver was enormously enlarged and showed *post-mortem* decomposition changes. Disseminated over the surface of all the lobes numerous raised whitish deposits ranging from the size of a pea to the diameter of half a rupee were seen. These nodules were firm in consistency, and whitish in colour on section. The liver substance was greenish and yellowish in colour, and soft and friable in consistency. Larger growths were seen in the substance of the liver.

The kidneys were normal in size and moist on section. The cortex was reddish in colour and normal in extent. The medulla was pale. The capsule was thin, stripped easily, and left a smooth surface. A secondary deposit about the size of a pea was seen adherent to the outer aspect of the capsule on the anterior surface of the left kidney.

The intestines showed no growth, and no sub-peritoneal secondary deposits were seen over them.

The uterus and appendages were normal.

The lymphatic glands in the gastro-hepatic omentum, at the head of the pancreas, in the mesentery, and in front of the vertebral column were enlarged, firm, and infiltrated with growth. The omentum showed small deposits in it. The lymphatic glands in the anterior and posterior mediastinum were enlarged, firm, and infiltrated.

The death was due to primary malignant disease of the liver with metastasis.

Report on the microscopical examination of the growths: A considerable degree of *post-mortem* decomposition has taken place and spoiled the finer details. The growth is composed of cells, which are mostly oval or rounded, many resembling large myelocytes. These are generally arranged in masses in the spaces of a fibrous stroma in which some small groups also occur. All the growths are quite similar, excepting that of the

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gland of the gastro-hepatic omentum. Much more fibrosis is seen here, and the spaces are much smaller. The cells, too, are smaller, and have nuclei which nearly completely fill them. The lining cells of the lymphatics in the fibrous tissue have large nuclei, which stain heavily, and the malignant cells are seen to form channels in some places. The appearances are suggestive of endothelioma.

As primary malignant disease of the liver is a very rare disease, not only in man but also in animals, the notes of this case may prove of interest.

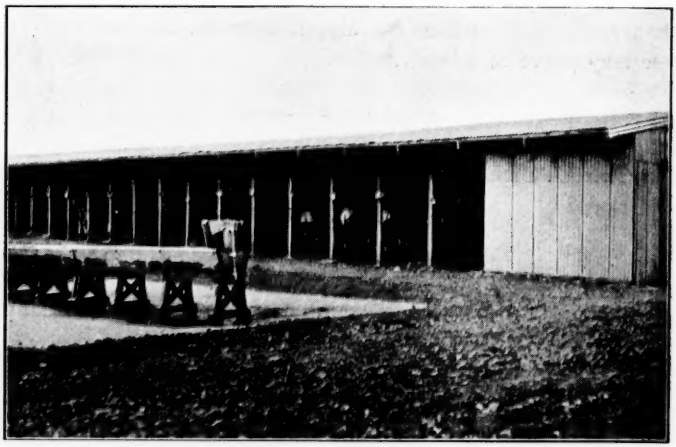
FRACTURE OF THE ATLAS IN A TOY POM.

By GUY SUTTON, F.R.C.V.S.
Kensington.

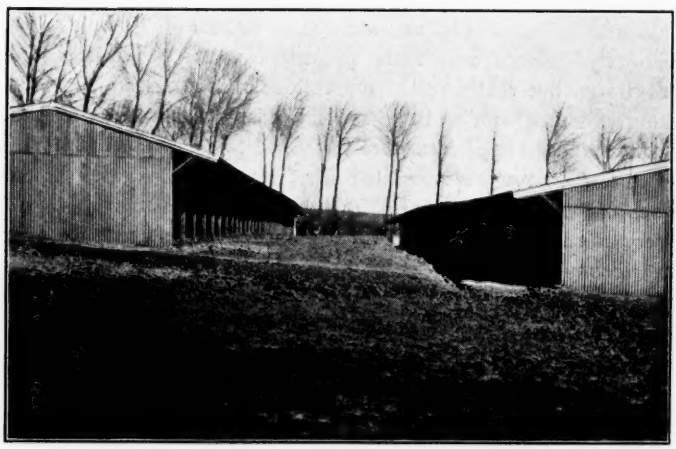
A POM was attacked by a bull terrier, seized by the back of the neck, and violently shaken. Within a few seconds the terrier was driven off and his victim rescued. Paralysis was almost complete and continued for forty-eight hours. Consciousness was now regained and the animal endeavoured to raise her head, but completely failed, and only succeeded in moving the lower jaw and screaming. When an attempt to forcibly raise the head was made the movement produced a convulsion and unconsciousness. A radiograph was taken three days after the accident, and showed a fracture of the atlas fairly distinctly. There was little precedent to help in forming a prognosis, but realizing the marvellous recoveries which Nature brings about, if not unduly handicapped by treatment, the whole circumstances of the case were explained to the owner. Absolute quiet and rest were stipulated for. Feeding was with liquids. The patient lay on a pad of Gamgee. An enema was given every third day, and the bitch discharged her urine once every twelve hours. At the end of three weeks she was able to raise her head and get up on her chest. The paralysis gradually subsided, and now after ten months the only sign of injury is pain when the muzzle is brought towards the chest.

ORIGINAL VIEWS OF ARMY VETERINARY CAMPS WITH THE EXPEDITIONARY FORCE IN FRANCE.

For the right to publish the following original and interesting photographic views of the work of the Army Veterinary Corps in France, and for those which appeared in our last issue on pages 335, 336, 337, and 338, we are indebted to Mr. George Monckton and to the proprietors of the *Illustrated London News*.



A.V.C. Veterinary Hospital—The Mules' Quarter, showing forage stores and water trough, constructed on concrete-drained base, with automatic water supply.



A.V.C. Veterinary Hospital.—One of the Isolation Wards for horses suffering from skin disease.

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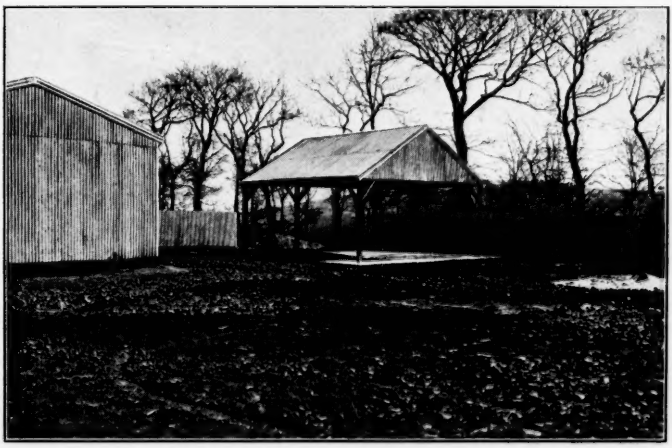
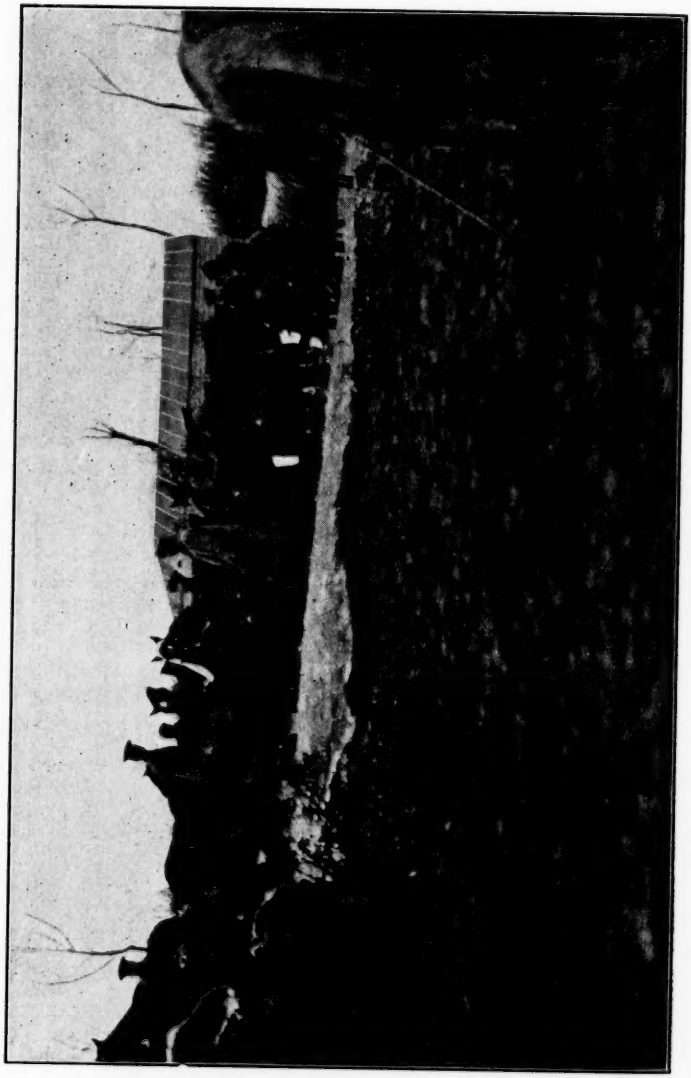
A.V.C. Veterinary Hospital.—Avenue of stalls for convalescents.



A.V.C. Veterinary Hospital.—Operating shed and pharmacy (on the left).



DIARY OF A VETERINARY OFFICER WITH A BRIGADE OF ROYAL FIELD ARTILLERY.

August 18, 1914.—Left Bordon with Headquarters Staff at 4 a.m. Left Southampton at 7.15 p.m.

August 19, 1914.—Arrived in France 7.30 a.m. with Headquarters (38 horses), —th Battery (98 horses), —th Battery (176 horses), Brigade Ammunition Column (200 horses). Rested at docks till 3.30 p.m. Went to No. 1 Rest Camp. Saw part of town. Bully-beef for all meals. Few casualties, and slight.

August 20, 1914.—Left —— Camp with Headquarters and —th Battery at 10.30 for station. Had to destroy horse of S.I.H., ruptured stomach.

August 21, 1914.—Left —— at 3.30. Great weather. Two casualties (slight). With Headquarters and —th Battery. Arrived Le N—— 9 p.m. Billeted in pub.

August 22, 1914.—Left Le N—— at 8 a.m. and marched to St. A——, arriving at 2 p.m. Orders received at 5.30 p.m. to proceed at once. Heard guns. Marched at 6 p.m. to ——.

August 23, 1914.—Arriving at 1.30 a.m. Lost one horse (dropped dead), and one left at farm between St. A—— and M—— for laminitis. Slept in open. Limbered up and cleared for action at 4 a.m. Guns moved off at 6 a.m. to cover. Left camp at V.S.N. at 10.45 a.m. Heavy firing all day. Arrived at farm on right side of road at 11.45. Rested. Saw foreign aeroplane. Brigade wheeled into action 1½ miles away, but did not open fire. Picketed out.

August 24, 1914.—Started at 3 a.m. with whole brigade. Not in action. Left 8 a.m. for G——. Several aeroplanes fired on. Heavy firing about one mile away. Retired from G—— to N—— M——.

August 25, 1914.—Left at 5.30. Arrived in Le G—— F—— 2.30. Rested there. Fired on by German Uhlan patrol at this place 6.30 p.m. First time under fire. Patrol got away uninjured. Stayed night here.

August 26, 1914.—Left at 4.30 for F——. Then to O——, arriving 8.30 p.m. Bivouacked there. Destroyed H.A. No. B2 Headquarters. Fractured off-hind fetlock. Very wet night.

August 27, 1914.—Left O—— at 10 a.m. and marched to G——. Short delay. Very wet. Marched on to B—— and bivouacked there.

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August 28, 1914.—Left B—— at 5.30 a.m. Came into action here 2 p.m. Routed enemy. Then marched to and bivouacked at B—— 8 p.m.

August 29, 1914.—Rested all day.

August 30, 1914.—Left B—— at 5.15 a.m., and passed through St. G——, then to Prémontrè Asylum. Got bread, wine, and chocolates from the nuns. Rested for an hour. Marched on to B—— 3.30 p.m.; had to shoot mare (worn out). Billeted in B——. Did all my horses.

August 31, 1914.—Started at 5.15 a.m. Feeling better. Marched through C—— to S——. Got some bread, chocolates, and matches. Rested here. Went on to M——.

September 1, 1914.—Left M—— at 4.30 a.m. for F—— (4.30 p.m.). Remained there for rest of day. Got letter, tobacco, and helmet from home; got left behind, dressing case. Had a very long walk to catch up. Feeling very mucky.

September 2, 1914.—Left F—— 1.30 a.m., and marched all day till 3.30 p.m. into B——, and bivouacked there. Major B—— went to hospital.

September 3, 1914.—Left B—— at 3 a.m. and marched to La F—— (12 noon). Long delay there. In action. Saw 2nd Division. Left La F—— at 3.30 p.m., and went on to Chateau de P—— (5 p.m.), and bivouacked there. Shot three horses 54th Battery, one horse Ammunition Column, and one —th Battery. Very warm day.

September 4, 1914.—Left Chateau de P—— at 5 a.m., and marched to C—— (10 a.m.). Rested here till 5.30 p.m., then marched through M—— to —— (9.30). Rather cold and windy. Destroyed two (2) horses (one of —st Battery and one of Ammunition Column on the march), also B12 of Brigade Headquarters. Heavy firing all day by 1st Division. Got all my horses shod.

September 5, 1914.—Started at 5.30 a.m. Had to destroy C——'s charger; fracture of near hind tibia; caught in gun wheel. Marched through M——, Z——, E——, and bivouacked at R——. Had dinner in convent (Bon Secours). Sent in weekly reports to A.D.V.S.

September 6, 1914.—Destroyed Br. M. (—th Battery). Sent four horses (three —st Battery, one Ammunition Column) to K——(Mobile Section). Left R—— at 7.30 a.m., and marched

all day (with long stops). Got in at 8.30 p.m., very fed up, to V——.

September 7, 1914.—Left V—— at 5 a.m., and took up position about two miles south and stayed till 2 p.m., and then went on to ——, arriving at 5 p.m., and later bivouacked at —— 8 p.m.

September 8, 1914.—Left —— at 6 a.m., and marched to S——. Got left, and was fired on in wood close by. Went on to H—— and had tea and met Brigade. Shot two wounded German horses. Bivouacked at B—— C——. Very wet.

September 9, 1914.—Left B—— C—— at 5.45 a.m. and marched to T——. Bivouacked there.

September 10, 1914.—Left T—— at 8.45. Marched till about 2 p.m., and then went into action, all three batteries. Did good work on German column. About 300 killed and wounded of one of our regiments. Moved off again at 5.30 p.m.,, and bivouacked at S——.

September 11, 1914.—Left S—— at 5.30 a.m., and marched to V——F——, arriving at 12 noon. Very wet day. Bivouacked here. Did all batteries.

September 12, 1914.—Left at 5 a.m. Wet day. Marched to B——, and saw thirty French and ten German soldiers dead and wounded about one mile out. Went on to V—— and bivouacked there. Good bivouac.

September 13, 1914.—Wet morning. Réveillé at 5 a.m., and left at 10.30 a.m. Horse (B.G.) —th Battery destroyed (paralysis and necrosis of lumbar vertebræ). Rested on road for two hours and then went on to B——, and bivouacked there 7.30 p.m. Dull day.

September 14, 1914.—Left at 6.30 a.m., and marched on to V——, Aisne. Big scrap there, and some heavy losses to Germans. Our Brigade in action, and —th did good work. Remained in V—— till 7 p.m., and then went on halfway between V—— and C——. Infantry lost a fair few. Both wheelers of our cook's wagon hit by bullets. One died later of internal hæmorrhage (hit over heart).

September 15, 1914.—Still in same place. Heavy firing all day by both sides. Did well. —th Battery lost some men killed and wounded (helped to dress latter). Our batteries in action. Wet day. "Little Willie" very busy, and caused most damage. Out

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at night with Robinson looking for wounded. Billeted in farm close by. Saw about sixty German prisoners.

September 16, 1914.—Still in same place and firing going on. Wet morning. One horse of —th Battery killed in action. Heavy guns (G.) firing all day; very little damage done. Bivouacked in same place.

September 17, 1914.—Wet day. Dressed number of cases of —th Battery (25th Brigade). Usual firing. Awfully wet. Good supper and good sleep. "Little Willie" pretty thick.

September 18, 1914.—Fine day. —th Battery seven horses killed in action. Shot, 2; died, 2; wounded, 11. Some men hit also. —th Battery: 3 killed, 9 wounded. Brigade Headquarters: My charger ("Paddy") wounded in neck.

September 19, 1914.—Guns started early. Awfully busy dressing cases till 3 p.m. Brigade Staff had to leave road about 3 p.m.—absolutely shelled out of it; then went to the farm, and shelling was awful there. No one could stir. At last, about 4.30 p.m., the end came. A shell from "Little Willie" (90 pounder) plunked through the barn roof, hitting Mr. A——, Regimental Sergeant-Major of the —th Brigade, the farrier of the —th Battery, Driver C——, Corporal V—— (the French interpreter), and killing Gunner G—— (cook) and two men of the —th Battery, also Bombardier W—— and another, and wounding several more. The only ones to escape were Captain T. H. R——, R.A.M.C., and Sergeant S—— (French interpreter).

My impression of it:—

A blinding flash of light, an appalling crash, then a dull pain in both knees, as if a heavy body had fallen on them, and then I felt the blood flowing from my cap. All was confusion and pitchy darkness for about three minutes. Some tried to rush out, but I quietened them by saying that I, too, had been hit, but wait till the dust cleared. Then I crawled out next door, sat down on the straw, and smoked a cigarette.

I had to dress my own wounds, one on top of crown of head (slight), one above left knee (slight), one above right knee (serious). I never felt faint or lost my head.

When the thing happened I was lying stretched in the straw, fagged out, smoking a cigarette. In about one and a half hours we were taken in ambulance to V—— (suffered agony all the

way), and there dressed. Had to get a lot of morphia from the medical officer. Had to have right field boot cut off. Hospital people very kind. One Battery lost heavily in horses: 9 killed, 1 died, 1 destroyed, 15 wounded.

September 20, 21, 1914.—Very well treated in hospital. Leg not so sore. Sent things to A.D.V.S. Down in dungeon all day for protection against shells. Left for V—— Hospital about 12 midnight in horse ambulance. Torture all the way. Got there 1.30 a.m. Had to get more morphia to sleep (still in stretcher). Wounds dressed again. Left here at 8.30 a.m. in comfortable motor lorry, and arrived about 2 p.m. at rail-head station, Braisne, and remained at clearing hospital until about 8.30 p.m., then put on train, but did not start till about 12.30 a.m.

September 22, 1914.—All day in the wagon. Jolting pretty bad. Terrible cramps in back and abdomen and stomach muscles. No cure to be got. Couldn't eat anything. Fairly good night.

September 23, 1914.—Still on the train. Saw a lot of troops and horses going to Front from base. Jolting still very bad. Had fair sleep and some champagne. Too tired to note down stations we passed through.

September 24, 1914.—Got to E—— at 4.30 a.m. Never slept a wink night or day. Got to St. Nazaire at 6.30 a.m. Got pipe from French soldier. Put in Australian motor ambulance and taken to Australian hospital at St. Nazaire and had wounds dressed. Undressed and put to bed here. X-rayed about 12 noon, and splinters of shell seen in both legs. Back to bed, no food, and left there 6.30 p.m.; then operated on and shells removed. Suffered torture all night through dressers putting splint too tight on right leg to stretch tendons under knee.

September 25, 1914.—My birthday (26 years old). Leg relieved in morning. Good wash and breakfast. Posted letter home and doctor's letters. Smoked and read most of day. Nice dinner. Got orderly to buy me penknife.

September 26, 1914.—Still glorious weather. Fairly good night's sleep. Wounds looking well. Slept most of the afternoon. Had champagne for dinner. Got shaved by French barber.

September 27, 1914.—Good night's rest. Got X-ray photo of leg from Major T——. Got head washed. Nothing new.

September 28, 1914.—Fair night's sleep. Wounds dressed by

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Captain S——. Taken on board the *Asturias* at 11 a.m. Lunch at 2.15. Bottle of stout (4d.). Very warm on the boat. Not to sail till to-morrow. Had good dinner at 7.30 (w. and s.). Plenty of old magazines to read.

September 29, 1914.—Good night. Splendid breakfast. Sailed at 11 a.m. Had legs dressed by Dr. McL—— (Scotch, and a good sort). Good dinner.

September 30, 1914.—Good night's sleep. Things same as yesterday. Had a shave. Passage still perfectly smooth. Could not land; stayed in harbour all night.

October 1, 1914.—Good night's rest. Left the boat at 12 noon and put in train. Left in train at 12.30 p.m. Got to London (Waterloo) at 2.30 p.m. Very comfortable train. Taken in motor ambulance to King Edward VII Hospital for Officers. Visited and spoken to by the King and Queen. Posted letters. Legs dressed. Splendid grub.

October 2, 1914.—Good night. Taken to Weymouth Street in motor to be X-rayed. Found another piece of shell in left leg.

October 3, 1914.—No breakfast; no lunch. Operated on at 10 a.m. Willie came to see me at 3.30 p.m. and stayed till 5 p.m., then had tea. Legs fairly comfortable. Awfully sleepy. Splint taken off.

October 4, 1914.—Quiet day. No sleep during day. Legs not dressed. Read most of day.

October 5, 1914.—Fair night. Leg very stiff all the morning. Very few visitors.

October 6, 1914.—Good night. Leg not painful.

October 7, 1914.—Fairly good night. Letters, &c., from home.

October 8, 1914.—Fairly good night. Had wounds dressed. Left leg looking A1. Discharge from shell wound in right leg. Had visit from Professor Mettam.

October 9, 1914.—Good night. Went for motor drive with Ford (Welsh Regiment) from 11 to 1 o'clock. Sent pipe to Robinson.

October 10, 1914.—Only fair night, leg uncomfortable. Nearly had row with night nurse. Said I swore at her when she woke me up. Went for motor run with Ford (Welsh Regiment). General Pringle came to see me.

October 11, 1914.—Good night. Went for motor run with Earl (R.F.A. 8th Brigade—lost left eye and broken left arm).

October 12, 1914.—Very good night. Legs dressed. New treatment (Bier's constriction hyperæmic) to be tried on right leg.

October 13, 1914.—Good night. No visitors. Had leg cauterized. Wet—could not go out.

October 14, 1914.—Good night. Tried Bier's treatment. Sitting up in chair from 3 to 5 p.m.

October 15, 1914.—Good night. Could not go out. Got up at 11 o'clock and went into sitting-room. Went out after lunch in Ralli's motor for a run with Swifte (Connaughts). Went to bed at 6.30.

October 16, 1914.—Good night. Went by myself in the motor. Up all day

October 19, 1914.—Started massage. Out after lunch in carriage. No visitors.

October 21, 1914.—Out for run with Lieutenant Grindley. Stopped fomentations. Started on crutches (not so bad).

October 22, 1914.—Good night. Crutches going strong. Moved to back ward. Wet. Not out.

October 23, 1914.—Had my first bath since the accident. Out for motor run with Mrs. Lane in her car. Two new patients.

October 24, 1914.—Fine. Out for run. Got stick.

October 26, 1914.—Sent to Lady Waterlow's, 29, Chesham Place, S.W.

October 27, 1914.—Good night. Leg dressed. Out twice in motor. Good day.

October 28, 1914.—Went to Coliseum. Good day.

October 29, 1914.—Went to see Belgian refugees.

October 31, 1914. Hippodrome, Monico, &c. Good day.

November 6, 1914.—Medical Board at War Office. Given permission to go home.

November 11, 1914.—Left London for home on sick furlough.

Abstract.

CEYLON: REPORT OF THE GOVERNMENT VETERINARY SURGEON FOR 1914.

Infectious Diseases.

Horses.—No outbreak of disease amongst horses occurred.

Cattle: Rinderpest.—Outbreaks of this disease occurred in all the Provinces except the Southern and North-Central. All were suppressed without serious loss. Figures are given in the statements annexed. On comparing the number of cases with the total number of cattle in the Provinces it will be seen that the extent of infection was small. Separate figures are given showing cases in Colombo town and at the quarantine station.

Foot-and-mouth Disease.—This disease prevailed all over the island.

Anthrax, Hæmorrhagic Septicæmia, and Surra.—The cases of these diseases are insignificant, excluding anthrax cases at the quarantine station, Colombo, three large shipments of sheep and goats being found infected on arrival from India, of which many died.

The total number of cattle for the whole island is 1,555,732, and the number of deaths from all causes is 23,939, giving a percentage of 1·54.

The veterinary officer in charge reports that 482 cases of foot-and-mouth disease and 9 cases of anthrax were detected in the station during the year.

Remarks of Superintendent, Civil Veterinary Department, Madras, who supervises the station:—

"The year from the point of view of disease has been a bad one, and, unfortunately, this coincided with the removal of the depôt to a new site. This was naturally attributed to being the cause of the trouble by the dealers opposed to the move, but I consider it only a coincidence, and in any case efficient quarantine was impossible at the old depôt.

"With the acquiescence and assistance of the Assistant Superintendent of Immigration and Quarantine, the work is now being carried out at the coolie immigration depôt, Tataparai, and I have recently asked this Government to move the Ceylon Government immediately to take up again the question of building a permanent depôt, for trying to carry out quarantine in temporary depôts is most unsatisfactory.

"I have suggested that a place at or near Tataparai be

selected for the permanent depôt, as this appears to be the nearest place to Tuticorin, where good water is available.

"There is a large well, about 150 yards from the coolie immigration depôt, which I was assured contains very good water, and has not been known to fail for the last twelve years.

"As regards the veterinary officer's request for an increased labour staff, I am inclined to agree with him that some increase is necessary, but I should like to hear what the Ceylon Government intends to do about building a permanent depôt before sending in any proposals under this heading."

The horses of His Excellency the Governor's escort, the police horses, the draught bulls of the Public Works Department, Convict Establishment, Botanic Gardens, and Government dairy cattle have been treated when necessary.

Horses for insurance under the Volunteer Horse Insurance Scheme have been inspected as required.

Disease amongst Stock.—No outbreaks of infectious disease occurred during the year. The stomach worm disease was responsible for most of the loss.

Working of the Dairy.—The expenditure during the year exceeded the receipts by Rs. 883.37½. Considering the troublesome year experienced, and the price of milk supplied to Government institutions, it is satisfactory. At the outset of the year the manager's suspension and dismissal caused considerable trouble. In March the labour trouble occurred, many coolies bolting in consequence of the scare over inoculation against plague. In August war broke out in Europe, and curtailment of expenditure became necessary.

Until October milk to most Government institutions was supplied at 30 cents per quart, which is below cost of production. On the abolition of inter-departmental payments from October 1, the value was estimated at 40 cents per quart, which is not far above cost price, and will hardly equal it when new contracts for cattle foods are made, as a rise in price is anticipated. Had the price been 40 cents per quart (*i.e.*, about 27 cents per bottle), which is below market price, during the first nine months of the year, a fair margin of profit would be shown.

At present the place seems to suit young stock better than older cows. Seven out of thirty-one cows sent there have died from severe diarrhœa, especially during the wet weather, when there is a large amount of young scrub growth. The farm is used for the purpose of keeping growing heifers and dry cows, which return to the dairy when approaching parturition.

G. W. STURGESS, M.R.C.V.S.,
Government Veterinary Surgeon.

Colombo,
February 26, 1915.

Translation.

ACUTE MUSCULAR RHEUMATISM IN THE HORSE.

By DR. E. GRÄUB, P.D.

Medical Establishment of the Remount Depot of the Swiss Confederation, Bern.

Hutyra and Marek give the following definition of muscular rheumatism: "As muscular rheumatism in human medicine we recognize an affection of the muscles, due to chill, causing muscular pain and corresponding functional disturbance with transient muscular contraction without inflammatory tissue changes. Against this in veterinary medicine an attack of muscular rheumatism is further characterized as depending on certain internal causes, without there being any purulent inflammation of muscle. Although there is a narrow border line between muscular rheumatism and myositis, the retention of the term muscular rheumatism is justified."

In horses muscular rheumatism is pretty frequently diagnosed. Cases of myositis with inflammatory symptoms and disturbance of general health are rarer. There are few records of such cases in horses.

Schwendimann has described a typical case which he noticed following influenza and which terminated favourably. Zschokke reports a case with a fatal termination. To him we are indebted for recent reports on the pathologic-anatomical changes. Magnin records different cases occurring in the course of strangles and influenza epidemics, some of which terminated favourably.

We will report on a case occurring in this establishment and which was observed right from its commencement.

On March 17, a five-year-old gelding was brought in. It was a hunter and had been used in our country for a year. The horse had a temperature of 40·7° C., pulse 64, respirations 24. Examination of the lungs negative. Severe angina. Little peristalsis. Dung coated with slime. Friction with ung. hydrarg. binoid. on the neck was ordered. Internally 200 grm. of ol. ricini. The next day the state was: Passage of fæces normal, appetite small. On the third day there was dullness over the right lung. Friction of the chest walls with spirit of mustard 8: 100. On the next day copious rusty brown nasal discharge. The pneumonia remained localized on the right side. Appetite better. On March 25 temperature was again normal and stood at 38·2° C.; heart beats still 64; respirations 28; dullness over lung absent and clear sounds. At the evening visit a large swelling at the left side of the withers was present, which extended to the upper edge of the shoulder-blade. The swelling was hard, warm, very susceptible to pressure, so that the horse groaned when it was palpated. Thinking it was only phlegmony due to the neck strap of the rug being too tight, warm Priessnitz's poultices were ordered. In the evening the attendant noticed that the patient which hitherto had not laid

down, fell down with a groan as if too weak to stand. Early on the horse got up once with much trouble, but soon laid down again. In the morning temperature was 38·4° C., pulse 64, breathing 28. The horse groaned and sighed uninterruptedly and seemed as if totally paralysed. Dung and urine were not passed, and the former was manually removed and the latter voided by urethrotomy after catheterization had failed to empty the bladder. Hœmoglobin cylinders and kidney epithelium were found in the sediment after centrifugalization of the urine and a large quantity of unchanged red corpuscles. The horse died. *Post-mortem* showed blackish red, not clottable blood, yellow hepatization of the lungs, friable and clay-coloured liver, spleen enlarged and with a tumour present the size of an egg, kidneys enlarged, capsule easily peeled off. Tissue of the cortical layer of the spinal cord covered with small round vacuoles; muscular tissue along the back soft and friable.

Sections of muscle imbedded in celloidin showed disintegration of muscle and round cell infiltration, and in some places hyaline degeneration of the muscle fibres.

Gräub considers that cases like this one showing acute polymyositis are probably due to intoxication or infection and are different from those rheumatic ailments generally due to chill.—*Swiss Journal of Veterinary Medicine.* G. M.

Review.

Aide-mémoire du Vétérinaire: médecine, chirurgie, formules, police sanitaire et jurisprudence commerciale. By H. J. Gobert, First-class Veterinary Surgeon to the Army Remounts. 1 vol., 736 pages, with 252 figures. Bound, 10 francs. Library J. B. Baillière et fils, 19, Rue Hautefeuille, à Paris.

This little volume is intended to help veterinary surgeons to remember the salient facts regarding all matters they are called upon to deal with in daily practice in connection with disease, surgery, obstetrics, therapeutics, sanitary police, inspection of meat, and commercial jurisprudence. The practitioner not blessed with an encyclopædic memory will find it a veritable treasure if used as a book of reference, and if referred to habitually he is not likely to overlook or omit any important detail in connection with any branch of his work or any problem item in that branch that may crop up in the course of his labours. We make more mistakes by not looking than by not knowing, and this volume helps us to look discerningly. It does not go deeply into the problems of disease, but the compass points on our sea of operations are clearly indicated, and no veterinary surgeon who uses the *vade mecum* intelligently ought to get lost on the pathological ocean he seeks to explore effectively, to hold in check, and rule beneficially. That the work has been of great value in France, and looked on favourably by a large

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circle of professional men, is proved by the fact that Monsieur H. J. Gobert now edits the fourth edition of a volume that was originally compiled by Monsieur Signol, and subsequently re-edited twice by Messieurs Signol and Cagny.

Numerous additions bearing more particularly on the chapters devoted to contagious diseases, surgery, therapeutics, sanitary police, and inspection of food have been made by Monsieur Gobert to the original and two subsequent editions. Sanitary legislation has been entirely overhauled and revised in France during the last decade, and the author has reviewed all the laws and decrees in connection with contagious maladies.

The illustrations add to the value of the letterpress, but a few of them, like some of the matter in the book, are a bit old-fashioned, and in some cases superfluous. The equine mouth-gags look as if they had been reproduced from examples that an up-to-date practitioner ought to have scrapped, and we think that tail-nicking operations are best consigned to oblivion nowadays. Nobody does them, and nobody wants to have them done.

G. M.

Obituary.

JOHN W. BROWNLESS, M.R.C.V.S.

THE news of the death of Mr. Brownless, from wounds received whilst serving in the Dardanelles, will be received with regret by practitioners in the West End of London, amongst whom he was well known as an "honourable opponent." Somewhat bluff in manner, but thoroughly straight in his dealings, he had a large *clientèle* in Kensington and district, having succeeded to the practice of the late W. Nettleton, M.R.C.V.S., in St. Mary Abbott's Terrace. His practice included several of the polo clubs, for the convenience of which he had established a branch practice at Barnes. His college career was a distinguished one, and he held the South African medals, having volunteered as a civilian veterinary practitioner during the Boer War. He had gone out to the Dardanelles with a regiment of artillery.

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